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09/964,648	09/28/2001	Keiji Yoshimura	862.C2397	1952

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EXAMINER
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CABRERA, ZOILA E

ART UNIT	PAPER NUMBER
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2125

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/964,648

Applicant(s)

YOSHIMURA, KEIJI

Examiner

Zoila E. Cabrera

Art Unit

2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 22 and 23 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7-11, 13-21,24-25 and 27 is/are rejected.
- 7) ☒ Claim(s) 3,6 and 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-21, 24-27 drawn to an exposure apparatus capable of selectively switching between a plurality of exposure methods, classified in class 700, subclass 121.
  - II. Claims 22-23, drawn to a maintenance method for an exposure apparatus, classified in class 700, subclass 108. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because an exposure apparatus capable of selectively switching between a plurality of exposure methods as claimed in Claim 1 and the broad statement of maintenance information of claim 24 does not require preparing a database for storing information on the maintenance of an exposure apparatus on an external network, connecting said exposure apparatus to a local area network and performing maintenance of said exposure apparatus. The subcombination has separate utility such as performing maintenance for any exposure apparatus.

During a telephone conversation with Steven Warner on July 18, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-21, 24-27. Affirmation of this election must be made by applicant in replying to this Office action. Claims 22-23 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Objections***

2. Claims 1, 4, 10, 11, 15, 19, 21-22 and 24 are objected to because of the following informalities:

With respect to claims 4, 10 and 11, lines 6, 17, 17, respectively, the use of the expression "and/or" renders the claim indefinite.

Regarding claims 1 and 15, line 1, the expression "capable of" renders the claims indefinite.

As for claims 19, 21 and 22, the expression "(claim 1)" on lines 9 and 12, respectively, should be deleted from such claims.

Regarding claim 24, lines 5-6, the limitation "the maintenance information" lacks antecedent basis.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4, 5, 7, 10, 11, 13, 19 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by **Nishi (US 6,462,807)**.

Regarding claims 1-2 **Nishi** discloses an exposure apparatus capable of selectively switching between a plurality of exposure methods (Col. 1, lines 28-31; Col. 5, lines 34-36), comprising:

- setting means for setting exposure conditions for an exposure target (Col. 5, lines 34-48; Col. 16, lines 22-27);  
a calculating means for calculating evaluation item values to determine the exposure method based on said set exposure conditions (Col. 16, lines 27-30; Col. 5, lines 34-48); and  
determining means for selecting an exposure method that matches the exposure conditions for said exposure target based on the evaluation item values calculated by said calculating means (Col. 6, lines 5-8; Col. 12, lines 55-57; Col. 19, lines 37-50; Col. 21, lines 12-16; Figs. 13-14, element 79; Col. 22, line 5 and lines 37-42);

- said determining means selects from among said plurality of exposure methods taking into account at least two evaluation item values for every wafer, shot or lot (Fig. 14, i.e., T and P).

With respect to claims 4 and 10, the same citations applied to claim 1 above apply as well for claim 10, and **Nishi** further discloses,

- said calculating means, in the calculation of said evaluation item values, calculates evaluation item values according to the location of a shot based on the position of the shot in the non-scanning direction (SX) on a substrate and/or the position of the shot in the scanning direction (SY) on the substrate and data (Col. 23, lines 15-20 and lines 27-39; Col. 21, lines 37-61; Figs. 15A – 15B), and said determining means selects an exposure method that matches the location of said shot according to said calculated evaluation item values (Col. 21, lines 55-61).

Regarding claims 5 and 11, the same citations applied to claim 1 above apply as well for claim 11, and **Nishi** further discloses,

- said calculating means, in the calculation of said evaluation item values, calculates evaluation item values related to a shape shift of a shot base pattern during multiple printing based on an image shift ( $\delta X$ ) in the non-scanning direction in the shot and/or image shift ( $\delta Y$ ) in the scanning direction in the shot (Col. 22, lines 5-22, 32-53; Col. 23, lines 40-67 – Col. 24, lines 1-4) said determining means selects an exposure method that matches conditions of the shape shift of a shot base pattern according to said calculated evaluation

item values during the multiple printing (Col. 22, lines 37-42 and lines 50-53; Col. 5, lines 14-23).

As for claims 7 and 13, the same citations applied to claim 1 above apply as well for claim 13, and **Nishi** further discloses,

- said calculating means, in the calculation of said evaluation item values, calculates evaluation item values taking into account at least any one of the shot, substrate and lot printing method indication value (Col. 16, lines 22-30), and said determining means selects an exposure method that matches the specified printing method based on said calculated evaluation item values (Col. 16, lines 27-30; Col. 19, lines 41-42; Col. 20, lines 22-33; Col. 21, lines 12-16 and lines 60-61; Col. 16, lines 18-21).

Regarding claim 19, the same citations applied to claim 1 above apply as well for claim 19. Please note that it is inherent that a plurality of semiconductor manufacturing apparatuses are installed in a factory for a plurality of processes including an exposure apparatus (Col. 1, lines 19-28).

Regarding claim 27, **Nishi** discloses,

- wherein when it is impossible to realize the exposure method due to the exposure conditions, said determining means registers a value exceeding threshold data for selecting said exposure method as an offset value in the calculated evaluation item values (Col. 21, lines 65-67 – Col. 22, lines 1-4) or registers a value for reducing this threshold as an offset value and determines a feasible exposure method.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-9 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Nishi (US 6,462,807)**.

With respect to claims 8 and 14, **Nishi** discloses the limitations of claim 1 above (same citations of claim 1 above apply as well for claim 14), and further discloses that a disadvantage of the step-and scan method is that the manufacturing cost of a stage mechanism becomes high since it is necessary to scan the reticle and the wafer in synchronization (Col. 3, lines 35-36 and lines 56-60). **Nishi** further discloses "pieces of positional and velocity information given therefrom are transmitted to the main control unit 100 and employed for the synchronization with the scanning motion of the reticle stage 30" (Col. 11, lines 18-21). However, **Nishi** does not specifically disclose calculating means for calculating evaluation item values to synchronize the drive stages taking into account a synchronization accuracy target value, and said determining means selects an exposure method that matches the synchronization of the drive stage based on said calculated evaluation item values. But **Nishi** discloses that it is an object of his invention to provide a projection exposure method capable of enjoying the advantages of the step-and-repeat method and the step-and-scan method and capable



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of compensating the disadvantages of the step-and repeat method and the step-and-scan method (Col. 5, lines 5-11; Col. 3, lines 35-36 and lines 56-60. Please note that one of the disadvantages is the synchronization). Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to have included a synchronization target value (Col. 11, lines 18-21, i.e., Please note that in order to synchronize a target synchronization value should be included) and selecting an exposure method that compensates the disadvantages of the step-and-scan method and step-and repeat method as taught by **Nishi** (Col. 5, lines 5-11) because it would allow to effect an exposure in the step-and-scan mode or the step-and-repeat mode, whichever is optimal (Col. 6, lines 5-7).

With respect to claims 9 and 15-17, same citations applied to claim 1 above apply as well for claim 15 and further **Nishi** discloses:

- the plurality of exposure methods include three exposure methods of static exposure that performs exposure with the stage standing still (Col. 18, lines 52-54), constant speed scanning exposure with the stage running at a constant speed while carrying out scanning exposure (Col. 11, lines 58-67 – Col. 12, lines 1-3; Col. 11, lines 22-25) and accelerated/decelerated scanning exposure with the stage running at an inconstant speed while carrying out scanning exposure (Col. 12, lines 4-12).

As for claim 18,

- said calculating means calculates the evaluation item values based on the exposure conditions for every lot, substrate and shot and said determining

means switches between exposure methods according to said evaluation item values (Col. 16, lines 27-30; Col. 19, lines 41-42; Col. 20, lines 22-33; Col. 21, lines 12-16 and lines 60-61; Col. 16, lines 18-21).

However, **Nishi** does not *specifically* disclose said determining means selects an exposure method that matches the exposure conditions from among the three exposure methods based on said evaluation item values. But **Nishi** discloses that determination means 79 selects the conditions upon which a step-and-repeat or static exposure and step-and-scan mode or scan-exposure selects (Col. 19, lines 37-40). **Nishi** discloses a time required for an exposure EX (Col. 19, lines 45-46), and further discloses time required for the scan-exposure, EXscan, (Col. 20, lines 24-30) wherein such time depends on the scan velocity  $V_r$  of the reticle (Col. 20, line 30). **Nishi** further discloses an exposure time for the step-and-repeat mode or static mode (Col. 20, lines 35-53). Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to determine an exposure mode taking into account the exposure time which includes the velocity because it would allow to optimally select an exposure mode that provides a higher throughput (Col. 20, lines 64-65; Col. 21, lines 3-4).

5. Claims 20, 21, 24, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Nishi (US 6,462,807)** in view of **Ozaki (6,128,403)**.

**Nishi** discloses the limitations of claim 1 and 19 above and with respect to claim 21 most of the citations applied to claim 1 above apply as well for claim 21. However,

**Nishi** does not specifically disclose some limitations of claim 21 and the limitations of claims 20, 24 and 25. But **Ozaki** discloses such limitations as follows:

As for claim 20

- connecting said plurality of semiconductor manufacturing apparatuses via a local area network (Fig. 2); connecting said local area network and an external network outside said factory (Col. 5, lines 54-61, i.e., internet browser; Col. 6, line 24; Col. 8, lines 49-52); acquiring information on said exposure apparatus from a database on said external network using said local area network and said external network (Col. 5, lines 54-61; Col. 7, lines 48-52 and lines 58-59; Fig. 4, i.e., APPARATUS INFORMATION); and controlling said exposure apparatus based on said acquired information ( Col. 8, lines 18-22).

As for claim 21,

- a gateway that connects said local area network and an external network outside said semiconductor manufacturing factory (Col. 5, lines 20-21).

As for claim 24,

- an interface for connecting a network (Fig. 2); a computer for executing network software that performs data communication of the maintenance information of said exposure apparatus via said network (Col. 5, lines 54-61; Col. 7, lines 48-52 and lines 58-59; Fig. 4, i.e., APPARATUS INFORMATION); and a display for displaying the maintenance information of said exposure apparatus communicated by the network software executed by said computer (Fig. 4).

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As for claim 25,

- said network software provides on said display a user interface for accessing the maintenance database provided by the vendor or user of said exposure apparatus connected to the external network of the factory in which said exposure apparatus is installed (Col. 5, lines 54-61; Col. 7, lines 48-52 and lines 58-59; Fig. 4, i.e., APPARATUS INFORMATION) and allows information to be acquired from said database via said external network (Col. 8, lines 49-52).

***Allowable Subject Matter***

6. Claim 12 is allowed.

The following is a statement of reasons for the indication of allowable subject matter: The allowability of the claims resides, at least in part, that the closest prior art of record **Nishi (US 6,462,807)** does not disclose or suggest, alone or in combination, the step of:

With respect to independent claim 12, **wherein said calculating means, in the calculation of said evaluation item values, evaluates whether or not to use previously measured correction data based on a shot layout correlation coefficient, and said determining means selects an exposure method according to the evaluation as to whether or not to use said evaluated previously measured correction data**, in combination with the other elements and features of the claimed invention.

7. Claims 3, 6 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

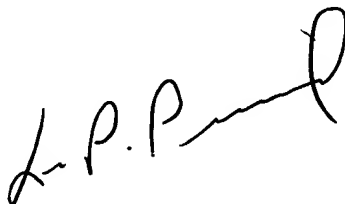
**Conclusion**

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning communication or earlier communication from the examiner should be directed to Zoila Cabrera, whose telephone number is (703) 306-4768. The examiner can normally be reached on M-F from 8:00 a.m. to 5:30 p.m. EST (every other Friday).

If attempts to reach the examiner by phone fail, the examiner's supervisor, Leo Picard, can be reached on (703) 308-0538. Additionally, the fax phones for Art Unit 2125 are (703) 308-6306 or 308-6296. Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist at (703) 305-9600.

Zoila Cabrera  
Patent Examiner  
7/25/03



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